

REMARKS

Claims 1-11 remain in the application. Claims 12-20 have been canceled without prejudice. Applicants reserve the right to pursue claims 12-20 in a divisional or other continuing application.

Information Disclosure Statement

Applicants respectfully request the Examiner to acknowledge and initial the information disclosure statement submitted by Applicants on August 16, 2002. A copy of the submitted information disclosure statement and returned postcard is submitted herewith for the convenience of the Examiner.

Applicants also submit herewith a supplemental information disclosure statement.

Claim Rejection -- 35 U.S.C. § 103

Claims 1-7 and 9-11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,413,852 to Grill et al. ("Grill").

Claim 1 is patentable over Grill at least for reciting: "etching the sacrificial layer using a chemistry that includes a noble gas fluoride to create an air core overlying the metallization level." Grill does not disclose or suggest using a noble gas fluoride for etching a sacrificial material. Grill column 7, lines 37-47, cited in the last office action, discloses etching of sacrificial place holder (SPH) 220' and 220 to form a structure with air gaps 270 using a variety of etchants, none of which is a noble gas fluoride.

The last office action also suggests that Grill 120, 130, and 140 read on the sacrificial layer of claim 1. However, Grill 120, 130, and 140 are not etched "to create an air core overlying the metallization level" as required by claim 1. SPH 220 is etched to create an air core 270 (see Grill FIG. 1N). However, it appears that air core 270 is over a substrate, not a metallization level. In fact, none of Grill's figures shows an air core over a metallization level. Furthermore, Grill does not disclose or suggest that SPH 220 is of a material etchable using a noble gas fluoride as required by claim 1.

For at least the above reasons, it is respectfully submitted that claim 1 is patentable over Grill. Claims 2-7 and 9-11 depend on claim 1. Therefore, claims 2-7 and 9-11 are patentable for the same reasons that claim 1 is patentable, as well as because of the combination of features set forth in these claims and in claim 1.

Claim Rejection -- 35 U.S.C. § 103

Claim 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Grill and further in view of U.S. Patent No. 6,355,498 to Chan et al. ("Chan").

As discussed above, Grill does not disclose or suggest etching of a sacrificial layer to create an air core over a metallization level. Neither does Chan. More specifically, Chan does not disclose or suggest formation of air cores over metallization levels.

Furthermore, although Chan discloses the use of xenon difluoride for micro-machining, Chan does not disclose or suggest the use of xenon difluoride for etching integrated circuit structures, such as layers over a metallization level that includes an interconnect line. In Chan, xenon difluoride is used to micro-machine a bulk resonator. Although the resonator may be coupled to an integrated circuit, the integrated circuit itself is not etched using xenon difluoride.

As noted in the specification (see Specification, page 8, lines 17-20), micro-machining is totally different from integrated circuit fabrication. For example, Grill does not disclose any sacrificial layer that may be etched using xenon difluoride to form an air core. At most, Grill discloses that its SPH 220 is "preferably dielectric and low-k so that any SPH residuals left after the extraction process will not short out the interconnect structure, or add significant capacitance" (Grill, column 8, lines 1-4). Grill does not disclose or suggest the use of a noble gas fluoride to etch SPH 220 or that SPH 220 comprises a particular material etchable by noble gas fluorides. It is notable that although Grill discloses a variety of etchants for SPH 220, none of them is a noble gas fluoride. It is also telling that although Chan discloses building its resonator on a semiconductor substrate as part of a monolithic integrated circuit (Chan, column 1, lines

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7-10), Chan limits the use of xenon difluoride to the fabrication of the resonator. It is thus respectfully submitted that it is not obvious to use xenon difluoride as an etchant in Grill. Therefore, claim 8 is patentable over the Grill/Chan combination.

Conclusion

For at least the above reasons, it is believed that claims 1-11 are in condition for allowance. The Examiner is invited to telephone the undersigned at (408)436-2112 for any questions.

If for any reason an insufficient fee has been paid, the Commissioner is hereby authorized to charge the insufficiency to Deposit Account No. 50-2427.

Respectfully submitted,
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